Russian Physics Journal 2013 vol.56 N2, pages 125-132

Tests in Kaluza-Klein gravitational theory in the presence of a scalar electric potential and a reactive potential

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Abstract

On the basis of a scalar electrical potential and a reactive potential in the generalized Gross-Perry metric, tests are proposed to confirm the possible existence of additional dimensions to space-time. Toward this end, use has been made of Kaluza-Klein theory, which is a natural extension of Einstein's general theory of relativity. For zero values of the components of the curvature tensor in 5D, the deflection of a light ray in the presence of a scalar electromagnetic potential is considered. An expression is obtained for the additional time interval for passage of a signal with allowance for the indicated potential near the Earth and planets. The radial motion of neutral particles in the presence of the scalar component of the reactive potential, determined here for the first time, is examined. © 2013 Springer Science+Business Media New York.

http://dx.doi.org/10.1007/s11182-013-0006-8

Keywords

dark energy, fifth dimension, fifth velocity, light deflection angle, scalar electromagnetic potential, scalar reactive potential, time delay of signals